



# OSWER Innovations Pilot

## ***Costilla County Biodiesel Waste-to-Energy Demonstration***

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*The Office of Solid Waste and Emergency Response (OSWER) initiated a series of innovative pilots to test new ideas and strategies for environmental and public health protection. A small amount of money is set aside to fund creative approaches to waste minimization, energy recovery, recycling, land revitalization, and homeland security that may be replicated across various sectors, industries, communities, and regions. We hope these pilots will pave the way for programmatic and policy recommendations by demonstrating the environmental and economic benefits of creative, innovative approaches to the difficult environmental challenges we face today.*

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### **BACKGROUND**

Biodiesel is a clean burning, non-toxic, renewable, and high-quality fuel made from vegetable oil or animal fats that can be used in any diesel motor with little to no modifications. Biodiesel is completely compatible with petroleum diesel, can be blended with petroleum diesel in any ratio, and will reduce emissions in proportion to the percentage of biodiesel used. Research on biodiesel as an alternative fuel has been conducted for more than 20 years and has intensified recently as biodiesel's emissions benefits have become more widely known. Small-scale biodiesel production can transform local vegetable oil feedstocks into an environmentally fuel without the need for large capital expenditures or expensive technology.

### **PILOT APPROACH**

The Costilla County Economic Development Council (EDC), in partnership with the U.S. EPA Region 8, USDA, and Costilla County, Colorado plan to test small-scale biodiesel production from diversified agricultural operations, e.g., seed oils, and waste restaurant oil to demonstrate the viability of producing this renewable energy at a local level. Additionally, once in full production the pilot will be able to recover methanol from the pre-treatment process which can be reused in the production of biodiesel; produce glycerol as a valuable byproduct as well as create jobs by adding value to local agricultural products (e.g., manufacturing canola oil). Agricultural processing and fuel production at the local level remove price inflation due to

distribution, generate income locally and establish a sustainable employment source.

Canola seed grown by local farmers will be crushed at the facility to produce oil for a feedstock for biodiesel production. Waste restaurant oils will be delivered to the facility by truck and stored in a heated, agitated, storage tank. Used cooking oils will be filtered, pre-treated to reduce free fatty acids, and chemically converted to biodiesel. Methanol mixtures removed from the process will be recovered to reduce costs and conserve resources.

### **INNOVATION**

Small-scale biodiesel production can occur almost anywhere. Rural agricultural communities can adopt a variety of crops to be used as a feedstock for biodiesel. Canola, soybeans, and sunflower seed crops can be crushed to produce oil for biodiesel. A more urban or non-agricultural area can produce biodiesel from waste restaurant oil. Approximately 2.5 billion pounds of waste cooking oils are collected annually from restaurants and fast-food establishments in the United States. The Costilla County Biodiesel Pilot Project will provide a model for producing biodiesel from diverse feedstocks in various geographic regions.

### **BENEFITS**

In 2000, biodiesel became the only alternative fuel in the country to have successfully completed EPA's required health effects testing required under the Clean Air Act.

These tests demonstrated that biodiesel does not pose a threat to human health. Biodiesel contains no sulfur or aromatics, and use of biodiesel results in substantial reductions of unburned hydrocarbons, carbon monoxide, polycyclic aromatic hydrocarbons, and particulate matter.

A 1998 full lifecycle study found that for every unit of fossil energy needed to make biodiesel, 3.2 units of energy are gained. In contrast, it takes 1.2 units of fossil resources to produce one unit of petroleum diesel. As America's energy sources change, biodiesel offers the potential to reduce our dependence on imported oil, and promote rural economic development and environmental improvement.

## **CONTACTS**

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For additional information, visit the EPA OSWER Innovations web site at: [www.epa.gov/oswer/iwg](http://www.epa.gov/oswer/iwg).